

CLAIMS

Sub a. 1. An apparatus for removing volatile organic compounds (VOC) from a VOC source comprising:

5 a gas stream flowing in a gas circuit away from and back to the VOC source, the gas stream being a VOC contaminated gas stream after the VOC source and a clean gas stream before the VOC source;

a scrubbing liquid flowing in a scrubbing liquid circuit;

10 an absorber having a scrubbing liquid inlet, the absorber communicating with both the gas circuit and the scrubbing liquid circuit and the absorber associating VOC from the VOC contaminated gas stream with the scrubbing liquid; and

15 a heat exchanger in fluid communication with the scrubbing liquid flowing in the scrubbing liquid circuit at a first point away from the scrubbing liquid inlet, the heat exchanger also in fluid communication with the scrubbing liquid circuit at a second point prior to the scrubbing liquid inlet to control the temperature of the scrubbing liquid immediately prior to the absorber, whereby the scrubbing liquid in the absorber conditions the gas stream to a temperature level appropriate for use as the gas stream is recycled to the VOC source.

20 2. The apparatus of claim 1 wherein the gas circuit comprises a plurality of gas streams flowing away from and back to a plurality of remotely located VOC sources, each gas stream being associated with one of a plurality of absorbers, each absorber located near and communicating with both one of the gas streams and the scrubbing liquid circuit and

the heat exchanger is in fluid communication with the scrubbing liquid prior to the scrubbing liquid inlet of at least one of the plurality of absorbers.

3. An apparatus for removing volatile organic compounds (VOC) from a VOC source comprising:

a gas stream flowing in a gas circuit away from and back to the VOC source, the gas stream being a VOC contaminated gas stream after the VOC source and a clean gas stream before the VOC source;

a scrubbing liquid flowing in a scrubbing liquid circuit;

an absorber having a scrubbing liquid inlet, the absorber communicating with both the gas circuit and the scrubbing liquid circuit and the absorber associating VOC from the VOC contaminated gas stream with the scrubbing liquid;

a separating means in the scrubbing liquid circuit for separating the VOC from the scrubbing liquid, the separating means having an inlet and an outlet; and

a heat exchanger in fluid communication with the scrubbing liquid flowing in the scrubbing liquid circuit at a first point away from the separating means inlet, the heat exchanger also being in fluid communication with the scrubbing liquid circuit at a second point prior to the separating means inlet to control the temperature of the scrubbing liquid immediately prior to the separating means inlet to increase the efficiency of the separating process.

4. An apparatus for removing volatile organic compounds (VOC) from a VOC source comprising:

a gas stream flowing in a gas circuit away from and back to the VOC source, the gas stream being a VOC contaminated gas stream after the VOC source and a clean gas stream before the VOC source;

a scrubbing liquid flowing in a scrubbing liquid circuit;

an absorber having a scrubbing liquid inlet, the absorber communicating with both the gas circuit and the scrubbing liquid circuit and the absorber associating VOC from the VOC contaminated gas stream with the scrubbing liquid;

a heat exchanger in fluid communication with the scrubbing liquid flowing in the scrubbing liquid circuit, the heat exchanger also in fluid communication with a third fluid circuit.

5. The apparatus of claim 4 wherein the gas circuit is comprised of a plurality of gas streams flowing away from and back to a plurality of remotely located VOC sources each gas stream being associated with one of a plurality of absorbers, each absorber located near and communicating with both one of the gas streams and the scrubbing liquid circuit

6. The apparatus of claim 4 wherein the third fluid circuit is a facility heating ventilation and air conditioning system.

7. A method for removing volatile organic compounds (VOC) from a VOC source comprising:

a. circulating gas through the VOC source to create a VOC contaminated gas stream;
b. scrubbing the VOC contaminated gas stream with a scrubbing liquid contained in a scrubbing liquid circuit to associate the VOC with the scrubbing liquid and create a cleaned gas stream;

c. selectively controlling the temperature of the cleaned gas stream by means of heat exchange between a first point in the scrubbing liquid circuit and a second point in the scrubbing liquid circuit in conjunction with the association of the VOC from the VOC contaminated gas stream with the scrubbing liquid; and

d. returning the cleaned and conditioned gas stream to the VOC source.

8. The method of claim 7 wherein step c. is exchanging heat between a point in the scrubbing liquid circuit and a third fluid circuit.

9. The method of claim 8 wherein the third fluid circuit is an HVAC circuit.

10. The method of claim 7 further comprising step e., separating the VOC from the scrubbing liquid.

11. The method of claim 10 wherein step c. is exchanging heat between a first point in the scrubbing fluid circuit and a second point prior to separating the VOC from the scrubbing liquid.